

MV-22 Osprey: Future Role and Impact for Medium Lift

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EXECUTIVE SUMMARY

Title: MV-22 Osprey: Future Role and Impact for Medium Lift

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Thesis: The MV-22's enhanced capabilities will allow the Marine Corps to achieve a greater operational distinction by enabling a timely response that is critical to our warfighting capabilities. The MV-22 will support key concepts, precision engagement and dominant maneuver, outlined in *Joint Vision 2010* while providing the Marine Corps unique latitude in force projection.

Background: The most significant advantage offered by the MV-22 is to rapidly self-deploy worldwide and arrive ready to fight. This will provide Marines the ability to quickly respond to crisis situations while reducing the impact on valuable strategic lift sorties. The Osprey's ability to fly significant distances enables Marines to respond rapidly to those situations that require immediate reinforcement or build-up of combat power. The Osprey provides unique latitude with its capability to self-deploy and greater versatility in employing military force. Two mission areas that are suitable to the Osprey's design are aerial refuel/tanker support and command and control (C2). Increasing the MV-22's role within the Marine Corps provides a single asset that can perform multiple missions. The enhanced capabilities of the MV-22 will extend operational reach for ship-to-objective-maneuver (STOM) and sustained operations ashore (SOA). The MV-22 will support maneuvering deep into the enemy's territory thus complicating his defensive posture. The MV-22 gives Marines the ability to attack a variety of locations over a vast area. The Osprey's superior speed will strengthen the elements of surprise and make forces less visible to an unsophisticated or disoriented opponent. The Osprey will give the commander greater flexibility in offensive and defensive operations. The ability to maneuver deeper into enemy territory will alter Marine tactics. The MV-22 allows Marines to focus on enemy weaknesses without getting into an attrition situation.

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Recommendation: The Osprey provides the Marine Corps a precision engagement capability with a greater assurance of delivering the desired effect while lessening the risk. Supporting dominant maneuver, MV-22 operations allow ground forces to conduct operations with decisive speed and tempo. With future enhancements (C2 and tanker), the MV-22 provides mission flexibility. To support deep maneuver, the MV-22 will require improvements in its ability to provide all weather support. The marked superiority of the MV-22's ability to deliver combat forces will change vertical assault operations. The capability to strike from greater distances and penetrate deeper into enemy territory provides unique latitude in force projection.

MV-22 OSPREY: FUTURE ROLE AND IMPACT FOR MEDIUM LIFT

Marines refer to themselves as a certain force in an uncertain world. This uncertain world is a world where superpower competition no longer exists and fear of superpower confrontation no longer suppresses the world's chaotic events. In future conflicts Marines will face a wider range of threats and unpredictable situations. The Marine Corps will continue to conduct military operations that support national interests. The Marine Corps must be prepared to conduct operations across the entire range of military options. To accomplish this task, the Marine Corps must maintain a highly expeditionary force designed to integrate the delivery of troops and supplies by a combination of air and surface means. The MV-22 Osprey is designed to meet the expeditionary needs of the Marine Corps while providing an asset that is flexible, responsive, and versatile. The MV-22 will fulfill a variety of missions within the context of its assault support role as no other aircraft will. Its unique capabilities provide tactical advantages that will give the Marine Corps operational latitude that supports force projection.

The employment of the helicopter in vertical assaults allowed commanders to concentrate forces beyond defended areas at a critical time and place in order to exploit opportunities. In amphibious operations these capabilities complement the surface assault by penetrating defended beaches, attacking enemy rear areas, blocking reinforcements, and enhancing surprise and deception. The future MV-22 vertical assault employment is essentially the same as the helicopter. However, future conflicts require capabilities to strike from greater distances and to penetrate deeper into enemy territory. The MV-22 will add new and impressive capabilities in speed, range, and endurance to

the Marine Corps assault support fleet. These enhanced capabilities will allow the Marine Corps to achieve a greater operational distinction by enabling a timely response that is critical to our warfighting capabilities. The MV-22 will support key concepts, precision engagement and dominant maneuver, outlined in *Joint Vision 2010* while providing the Marine Corps unique latitude in force projection. This interpretive essay will analyze the overall marked superiority of the MV-22's role in force projection. First, this analysis will examine the MV-22's impact on global strategic agility. Discussion shall focus on the Osprey's advancement in self deployment, rapid mobility, and the ability to conduct agile combat support. Second, this analysis will examine how the MV-22 will broaden operational reach. Discussion shall focus on the MV-22's role in deception operations, offensive and defensive maneuver, and deep maneuver. Both areas will highlight the significance of the MV-22 and its role for future mobility.

Global strategic agility means being at the right place at the right time with the right capabilities for crisis situations. The National Military Strategy (NMS) supports the strategic concepts of overseas presence and power projection that is critical for deterrence, conflict prevention, and warfighting capabilities. Crisis response enables forward deployed or the required U.S. based forces to respond to protect our national interests. Crisis response demands adaptable forces with agile weapon systems that can address trouble anywhere. The most significant advantage offered by the MV-22 is to rapidly self-deploy worldwide and arrive ready to fight. Defense budget cuts and military downsizing have reduced strategic airlift assets. Presently CH-46 squadrons require four C-5 and one C-141 equivalent sorties to move personnel and equipment. MV-22 squadrons will only require two C-141 equivalent sorties to do the same. This

will provide Marines the ability to quickly respond to crisis situations while reducing the impact on valuable strategic lift sorties. Strategically, the Osprey guarantees more rapid power projection and reduced logistics load. As a result, we improve our capabilities for worldwide deployment while becoming more tactically mobile. Mobility requires timely response that is critical to our deterrent and warfighting capabilities.¹ When warfighting CINC's are faced with a crisis situation, the MV-22 offers versatile options.

The Osprey's self-deployment capability enables the Marine Corps to respond expeditiously to crisis situations. The MV-22's self-deployment ability enables the aircraft to fly 2500 nautical miles (nm) utilizing one refuel evolution. To support the movement of a squadron, KC-130's can transport maintenance crews, spare parts, and other critical items associated with long ferry flights. In addition, KC-130's can accompany MV-22's for long overwater flights to act as emergency inflight refuelers in the event of fuel transfer or fuel system failure. The significance of the self-deployment

¹Gen. J. M. Shalikashvili, USA, CJCS, "Joint Vision 2010: Force of the Future," Defense 96, Issue 4, DOD Washington D.C. Page 8.

capability provides a reduction in the amount of strategic air lift sorties required to move one Marine medium lift squadron. In addition, a MV-22 squadron can arrive in the theater of operations with very little support from other Services.

Another area of importance is the ability to fly 2500 nm with combat loaded Marines. Since there is no supplemental oxygen capability for passengers, the self-deployment mission is designed around a crew of four. The use of a palletized mission kit, presently in use by the Air Force, can provide supplemental oxygen for passengers. To range 2500 nm with one aerial refuel, flying in the mid-teens (14,000-18,000 feet), the aircraft will require 8,000 pounds of internal fuel in the cabin auxiliary tanks. The basic aircraft and auxiliary fuel with one complete refuel (inflight or ground) should allow for this mission. If the cabin auxiliary tanks allow for passenger seating, and the oxygen issue resolved, the aircraft should be able to accommodate an additional payload of 2500 pounds (8 Marines).² This capability enables six MV-22's to move a platoon from the Azores to Liberia. The aircraft's ability to fly significant distances allows the MV-22 to arrive in the theater of operations without a significant reliance on strategic lift, and the MV-22 can move combat Marines long distances without reliance on a runway environment. Although the capability to fly 2500 nm projects minimum ground combat power, the Osprey's ability to fly significant distances enables Marines to respond rapidly to those situations that require immediate reinforcement or build-up of combat power subsequent to the arrival of larger forces.

²Maj. W. Wainwright, Telephone Interview. MV-22 Test Team NAS Patuxent River, Maryland. December 1996.

Rapid mobility ensures credible power projection and transportation of decisive combat power to a geographic location. Since there is a reduction in the number of U.S. forces permanently stationed overseas, the MV-22 increases our ability to project forces abroad. A credible power projection capability compliments our overseas presence by acting as a deterrent to potential adversaries.³ The MV-22 can support power projection at the strategic, operational, and tactical levels for conflicts. At the strategic level, the ability to self-deploy enables timely arrival in order to seek a temporal advantage. The demands for strategic airlift are substantially reduced and options for the deployment and employment of Marine forces is multiplied and held open for a longer period of time. At the operational level, the MV-22 can assist in the movement of critical supplies and forces to a location that achieves operational objectives. At the tactical level, the MV-22 can maneuver forces in combat formations into the operational area. The MV-22 provides greater flexibility and versatility in employing military force. Operating on amphibious shipping, the MV-22 offers a credible forcible entry that is independent of forward staging bases and politically sensitive overfly rights. The extended range of the MV-22 along with the amphibious ready group (ARG) sailing along an extended coastline allows Marines to threaten a wide area. This compounds the adversary's defense problems and provides the U.S. with a credible force to deter aggression. Credible power projection enables timely response and is essential in supporting National Military Strategy (NMS) while preventing conflicts and winning wars. The MV-22's

³Gen. J.M. Shalikashvili, USA, CJCS, National Military Strategy of the United States of America 1995, DOD Washington D.C. Page 7.

capabilities provide an asset that is highly mobile and will remain essential to future military operations that support that strategy.

The U.S. Armed Forces are in their sixth year of reduction in force structures. With the national debt at the forefront of policy debate and war not foreseeable in the distant future, defense spending will encounter further cutbacks. Faced with flat budgets and increasingly more costly readiness and modernization, the Marine Corps must modernize aircraft inventories with capabilities that can perform multiple missions. The MV-22 is the cornerstone of conceptual operations envisioned for the Marine Corps for the next 30 to 40 years. The MV-22 can provide agile combat support by its future ability to conduct multiple missions. With future enhancements that will deliver multi-mission capabilities, the Osprey provides greater versatility in employing military force.

Two mission areas that are suitable to the Osprey's design are aerial refuel/tanker support and airborne command and control (C2). First, the MV-22 would be compatible for conducting aerial refuel/tanker support to both fixed-wing and rotary-wing aircraft. If the Marine Air Ground Task Force (MAGTF) commander requires extensive Offensive Air Support (OAS), the MV-22 could provide tanker support to fixed-wing aircraft operating from the aircraft carrier or amphibious ships. The MV-22 could conduct the same tanker mission at suitable altitudes and airspeeds for rotary-wing aircraft. For example, CH-53E's may be required to move Light Armored Vehicles (LAV's) beyond their combat radius. An MV-22 configured for aerial refuel/tanker support could perform this mission at slower airspeeds compatible to the CH-53E. In addition, the MV-22 could conduct tanker operations for other MV-22's that are self-deploying or involved in contingency operations.

Another mission suitable for the MV-22 is airborne C2. The Osprey could be configured to conduct the Direct Air Support Center, Airborne, (DASC (A)) mission. The MV-22 could not lift the existing DASC (A) package configured for the KC-130. However, a lower cost communication package could be developed for the Osprey that gives the Marine Corps an airborne C2 capability. This C2 package might be utilized on MEU (SOC) missions to support the MAGTF. The MV-22's flight characteristics enhance airborne C2 and provide flexibility to the Marine Corps.

At this time no requirement exists to configure the MV-22 for tanker or airborne C2 missions. In addition, the KC-130 can perform both missions significantly better than the MV-22. However, the MV-22's turboprop design can provide unique latitude by conducting more missions than vertical assault. Increasing the MV-22's role within the Marine Corps provides a single asset that can perform multiple missions. Cutbacks in defense spending and reduced force structures require aircraft to provide agile support and the ability to conduct multi-mission profiles.

Inherent in the enhanced capabilities of the MV-22 will be the ability to extend operational reach for ship-to-objective-maneuver (STOM) and sustained operations ashore (SOA). The MV-22 will support deep maneuver into the enemy's territory thus complicating his defense posture. The Marine Corps must prepare to face a wide variety of threats employing various combinations of technology at different levels of intensity. Enhanced mobility requires Marines to cross great distances, reduce limitations imposed by terrain and weather, and transition from maneuvering at sea to maneuvering ashore.⁴

⁴"Operational Maneuver From The Sea," Marine Corps Gazette, Marine Corps Association, Quantico, Va. Page A-5

The MV-22 will transport a vertical assault force deep into enemy territory. This will create a problem for the opponent. The enemy could choose to focus his efforts on a defensive posture that protects his coastline. Consequently, vertical assault forces can accomplish significant inland objectives thereby reducing enemy coastal defenses. If the enemy reacts to the vertical assault force, the surface assault will create gaps and exploit success. The enemy will be forced to disperse combat forces in greater depth in order to protect vulnerable rear areas. The surface assault will have a better opportunity to maneuver to their objective against limited opposition. The MV-22 gives Marines the ability to attack a variety of locations over a vast area. These forces can be reembarked and strike another location before the enemy can decisively engage. The opponent will be overwhelmed since he will receive conflicting reports indicating that his forces are engaged in several locations. The extended range and endurance of the MV-22 allow follow-on waves to be inserted and relocation of the initial wave to a new location. Marines will maintain a rapid operational tempo that the opponent will have difficulty coping with.

The MV-22 will capitalize decisively on STOM and SOA by exploiting the roles of tactical surprise and deception. Superior speed will strengthen the elements of surprise

and make forces less visible to an unsophisticated or disoriented opponent. Tactical surprise can be achieved through deception or demonstration operations that force the enemy to react to false information. The MV-22 can perform demonstration operations at a place so distant from the objective that the enemy response will remove him from the final assault. Yet, the Osprey has sufficient endurance remaining to participate in the main assault. Vertical assault forces will be available to participate in deception operations prior to their arrival at the objective. The speed and endurance of the MV-22 also allow demonstration operations to be conducted subsequent to the main assault without returning for a refuel evolution. The Osprey will be the first assault support aircraft with sufficient range to conduct credible deception operations. In addition, extra MV-22 sorties are not required for deception since the aircraft can perform both missions. Surprise will be achieved by limiting the enemy's ability to react effectively. Accurate intelligence gathered through reconnaissance and surveillance combined with a convincing deception plan will enable our forces to surprise the enemy from an unexpected direction and time. Utilized effectively in deception operations, the MV-22 will compliment other MAGTF platforms (LCAC and AAV) with different capabilities to be more effective.

The MV-22 will afford the MAGTF commander the opportunity to conduct offensive and defense operations with superior mobility. Marines operating in SOA will require enhanced mobility. In offensive operations the MV-22 will allow the commander to conduct wider and deeper attacks. With SOA an opponent may resort to a linear pattern of battlefield grouping. However, the enhanced mobility offered by the MV-22 can break open the battlefield by Marines. A reinforced infantry battalion transported by MV-22's

and CH-53E's can assault behind the enemy's main positions while mobile ground forces penetrate his defenses. In addition, the commander can employ covering forces consisting of LAV's, supported by MV-22's, along a broad front or deep to destroy selected targets. Logistical support to sustain maneuvering forces will be enhanced by the speed and range of the MV-22.

In defensive operations the MV-22 permits the commander to deploy security forces further out while maintaining the capability of rapid withdrawal. The Osprey offers the commander the capability to conduct an air mobile defense. If forced to defend along a linear front, the MV-22 will possess the agility and speed to close gaps or move forces laterally for a counterattack. In addition, reserve units can be located further behind the forward edge of the battle area (FEBA) and achieve the same response that traditional helicopters offer. The MV-22 offers a significant advantage of speed to enhance maneuver and create new methods to employ Marine ground units in offensive and defensive operations.

In the future, the ability to maneuver deeper into enemy territory will alter Marine tactics. The MV-22 allows Marines to focus on enemy weaknesses and fight without getting into an attrition situation. When enemy forces mass for the attack, the MV-22 can maneuver units to delay an advancing enemy while OAS sorties or supporting arms neutralize the enemy. This will eliminate Marines fighting from static positions. MV-22 operations will support freedom of maneuver by interrupting the enemy's tactical game plan and focusing on its vulnerabilities. Deep maneuver will exploit enemy gaps thereby enabling Marines to attack the enemy's C2 system. This maneuver advantage will reduce the enemy's reaction time and enable Marines to gain and maintain the initiative. Superior

maneuver will generate psychological shock by rapid concentration and dispersion throughout the engagement. This will inhibit the enemy's ability to concentrate his forces. The MV-22 will enable deep raid operations into the enemy's second echelon and reserve areas. Company-sized forces (inserted by MV-22's) conducting limited objective raids can attack headquarters units, communication facilities, and major logistic concentrations to disrupt enemy operations. The endurance of the MV-22 will also allow the aircraft to orbit and await the call for quick extraction. Deep maneuver will enable Marines to employ the principle of economy of force. In addition, successful maneuver will create confusion and may prevent the enemy from devoting greater effort preparing fixed defenses.

The MV-22's role in deep maneuver will establish medium lift aircraft as the primary means of support to the Ground Combat Element (GCE). To support deep maneuver the MV-22 must possess adverse weather capabilities that enable the aircraft to conduct its mission without reliance on visual cues. The future battlefield will utilize smaller units acting as independent teams infused with technology, improved targeting, and command and control assets. These units will be equipped with the latest equipment in target designation and locating devices. Small sized units will be displaced throughout the battlefield operating independently from larger units to engage the enemy with indirect fires and disrupt enemy actions. The MV-22 provides the ideal vehicle to move and relocate these units throughout the battlefield. The MV-22's enhanced speed, range, and endurance can displace small units great distances to support this operational concept. The existing configuration for the MV-22 cannot support ground units when the weather conditions degrade and the pilots lose visual cues for landing. The MV-22 will have the

ability to fly in adverse weather conditions above minimum obstacle clearance altitudes without visual cues. However, without terrain following (TF) and terrain avoidance (TA) radar's the MV-22 will not be able to insert or extract units when weather conditions degrade. This will create a problem for deep maneuver if the primary vehicle is limited to certain weather criteria. Deep maneuver requires the MV-22 to navigate at low altitudes in mountainous terrain under adverse weather conditions and land to a coupled approach hover with no reliance on visual updates during the flight. Without the proper systems (TF and TA), Marines cannot conduct deep maneuver and expect all weather support. Successful execution of deep maneuver requires the MV-22 to conduct all-weather operations and the ability to support ground units displaced throughout the battlefield.

Because the MV-22's role in deep maneuver will continually expose the aircraft to hostile fires, issues surrounding protection of the MV-22 will have increased significance. The MV-22's speed and endurance offer threat avoidance and the ability to circumnavigate known enemy threat locations. However, the Osprey will face an increased probability of being exposed to man portable air defense systems (MANPADS) and small arms/antiaircraft artillery (AAA) fires. Unsophisticated forces can make vertical assault operations difficult since exact enemy locations will be impossible to locate and target. The MV-22's combat survivability will be increased through design features that reduce infrared (IR) signature, acoustic signature, and increase ballistic tolerance. However, the Osprey may be exposed to hostile fires that cannot be detected, avoided, or neutralized by preassault operations.

Armed escort sorties will be required to protect the MV-22 against residual or reactionary threats. The airspeed and endurance compatibility of the MV-22 between attack fixed-wing and attack rotary-wing aircraft produces a dilemma for mission planners. Fixed-wing aircraft possess sufficient speed, but lack the endurance unless tanker support is available. In addition, fixed-wing aircraft have tactical maneuvering difficulties when delivering fire support for assault support aircraft engaged in close proximity to the landing zone (LZ). The AH-1W possesses sufficient endurance, but lacks the speed to remain attached to the MV-22. The AH-1W provides the capability to engage targets that pose a threat to assault aircraft in close proximity to the LZ.

Future escort principles for the MV-22 must rely on objective area response-- detached escort. The MV-22 will fly at altitudes and airspeeds that provide the greatest reach, endurance, and best margin of safety against the threat. Fixed-wing aircraft can launch and remain at altitudes to provide suitable endurance and respond to threats in close proximity to L-hour. Fixed-wing aircraft can provide reconnaissance for that portion of the route that MV-22's will descend or reduce airspeed to transition into the landing phase. The AH-1W will have to utilize auxiliary fuel tanks or rapid ground refueling (RGR) provided by CH-53E's or KC-130's to support MV-22 operations beyond their combat radius. AH-1W's will rendezvous with MV-22's as they transition to landing or provide reconnaissance for the objective area prior to L-hour. The MV-22 assumes a margin of risk when not receiving attached escort. However, fewer sorties will be required to employ detached escort allowing optimized employment of OAS sorties against known enemy locations. Until a tilt-rotor attack variant is fielded, mission

planners must optimize the capabilities of both fixed-wing and rotary-wing attack aircraft when supporting the MV-22 in deep maneuver.

As an expeditionary force, the Marine Corps is the most likely Service to face the full spectrum of operational environments in the twenty-first century. The MV-22 provides operational and tactical advantages in a world where warfare is conducted on various intensity levels. To achieve decisive results in future conflicts, the MV-22 will be strategically deployable as part of a joint or multinational force. Operations utilizing the MV-22 are characterized by surprise, speed, rapid concentration of forces, and flexibility. Superior speed and range allow greater creativity with respect to deception and tactical surprise. The MV-22's speed, range, and versatility compliment other MAGTF and Navy mobility and firepower systems. When used together with other mobility systems, this aircraft provides the Marine Corps marked superiority in tactical mobility. With future enhancements (airborne C2 and aerial refuel/tanker) that will deliver multi-mission capabilities, the MV-22 will provide mission flexibility for the Marine Corps. The MV-22 provides MAGTF forces an over the horizon vertical assault capability and allows the ground commander to extend ground operations against operational objectives. This precision engagement capability provides a greater assurance of delivering the desired effect while lessening the risk to our forces.

Supporting dominant maneuver, MV-22 operations allow ground forces to seek positional advantages and conduct operations with decisive speed and tempo. The ability to conduct extended range vertical assault operations allow Marines to deliver decisive combat power more effectively. By exploiting its full range and endurance capabilities, the MV-22 has the ability to achieve decisive superiority at any given time or place.

Future amphibious warfare concepts will depend heavily on the MV-22 to move and resupply maneuvering units.

The MV-22 is the cornerstone of conceptual operations envisioned for the Marine Corps for the next 30 to 40 years. To support future operational concepts, the MV-22 will require improvements in its ability to provide all weather support. The marked superiority of the MV-22's ability to deliver combat forces will change vertical assault operations. This capability to strike from greater distances and penetrate deeper into enemy territory provides unique latitude in force projection.

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